

Wildflower Hotspots of the Eastern Sierra

Welcome to the Eastern Sierra

The Eastern Sierra truly is a land of superlatives: the oldest living trees on the planet (bristlecone pines); the highest peak in the contiguous United States (Mt. Whitney); the youngest mountain range in North America (Mono Craters); one of the oldest lakes in North America (Mono Lake). All of these and more are within an easy day's drive of each other. The spectacular landscapes of this area draw a worldwide audience, and with good reason.

Geology field classes often visit the area for the relatively easy access to a wide variety of geologic formations and rock types. Volcanic craters, basalt flows, layers of ash and pumice, carbonate formations, and granite peaks, walls, and spires all can be seen here

Elevations you will visit using this guide range from 3,300 feet (1,005 meters) at Fossil Falls to 10,200 feet (3,100 meters) at the Mosquito Flat trailhead in Rock Creek. Many of the peaks around you soar to more than 13,000 feet, and a side trip into Death Valley will plunge you down to below sea level at Badwater.

The elevation range combined with the diverse geologic environment results in a wide variety of vegetation communities. Three major biotic provinces—the Mojave Desert, Great Basin, and Sierra Nevada—all converge in this area. Dozens of plant communities and thousands of plant species occur here, many of them unique to the Eastern Sierra. This guide is an introduction to the botanical gems to be encountered here. Once you've visited the sites in this guide, perhaps you will be inspired to further explore this land of superlatives on your own.

Viewing Tips

About this Guide

Wildflower Hot Spots of the Eastern Sierra highlights the unique ecology, geology, and unparalleled flora along 150 miles of the Eastern Sierra corridor. Twelve wildflower sites have been selected to represent the diversity of environments that are found throughout the Eastern Sierra. Each site features directions, a map, GPS coordinates, a description of the natural history of the area, and photos. Topics you can learn about include plant rarity, disturbance processes, and the many ways people use plants. "Can You Find...?" proposes a fun challenge for you and your family. For a more in-depth look at the species found at each site, use the plant list featured in the back of this guide. Take the time to stop and smell the flowers in this extraordinary Eastern Sierra region!

Feast or Famine

It's all about the water. The amount as well as the pattern of precipitation and temperatures strongly affect the abundance and diversity of wildflowers, particularly at the drier and warmer low-elevation sites. In some years the area is carpeted with blooming wildflowers, while other years there are few to be found. If you visit in a dry year, you can entertain yourself with a closer look at the shrubs and trees. The variety of shapes, structures, and leaf types may surprise you with their own brand of beauty. If all else fails, enjoy the geology and views and pledge to return in a better flower year!

Choose Your Season

Wildflowers bloom in different sites at different times of the year, so your choice of viewing sites to visit will depend upon when your travels bring you to the area. There are blooms throughout the spring and summer, beginning as early as March at Fossil Falls and working your way north or higher in elevation up to Tioga Pass or Rock Creek, where flowers can be seen as late as September. Keep in mind that weather can influence how early or late things bloom in each area.

Use Field Guides

This guide can show you only a tiny fraction of the plant species that grow here. Using plant guides available for this area can help add to your discovery. Guides are available in local bookstores and visitor centers.

Be Considerate

Take only photos, leave only footprints. Please refrain from the urge to take flowers home or back to camp with you. Other visitors will want to enjoy them after you. Insects, birds, and other wildlife depend on vegetation, including flowers, for food and cover. Please take care not to disturb these creatures or their homes. Stay on roads and trails and pack out all your trash. Park in parking areas; where no designated parking area is available, choose parking sites carefully to minimize damage to vegetation.

Come Prepared

The weather can be unpredictable, even in summer. Bring multiple layers of clothing and be prepared for summer thundershowers. The sun is intense here, so be sure to use sunscreen, wear a hat, and drink plenty of water. You may find yourself a bit winded at the higher elevations; take it slow. Sturdy shoes are a good idea if you plan to do much exploring on foot. Handy tools of the trade to bring along may include a camera, binoculars, and a hand lens or other magnifier to investigate tiny flower features

Fossil Falls

Details

- **Directions:** Follow Highway 395 south from Lone Pine for 45.4 miles, turn left at Cinder Road, and follow signs to Fossil Falls, approximately 1 mile off the highway.
- **Location:** GPS coordinates (UTM NAD83) for turnoff to Cinder Road off of Highway 395: **Easting:** 417054 **Northing:** 3981043
- **USGS Quad Map:** Little Lake.
- **Elevation:** 3,310 feet (993 meters).
- **Habitat(s):** Desert/Mojave scrub.
- **Landscape:** Rolling volcanic flows with prominent cinder cone and water-sculpted canyon.
- **Facilities:** Campground, parking area, bathroom, kiosk.

Description

Fossil Falls is a place where fire and water have formed a rugged and unique landscape. Periods of volcanism dating as far back as 440,000 years ago laid down the initial basalt matrix, which was subsequently covered by numerous flows emanating from the Coso mountain range to the east. The red cinder cone visible to the north is the result of the violent eruption of trapped gases and molten material. Cooling quickly when exposed to the air, the molten material formed a porous rock known as scoria, which built up around the original vent to form a cone-shaped hill.

During the Pleistocene, the Owens River flowed south out of Owens Lake into the Indian Wells Valley. Volcanic eruptions from the Coso Range changed the river's course at least three times. Fossil Falls was formed when the Owens River was dammed by an eruption and ran over the basalt flows, sculpting and polishing the black rock into a spectacular geologic feature. Follow the 0.4-mile walking trail from the kiosk to access the falls and see a landscape resplendent with botanical treasures of color, form, and species diversity along the way.

Flower Facts

The vegetation at Fossil Falls typifies the Mojave Desert. Two key plant species that let us know we are in this floristic zone are burro-bush (*Ambrosia dumosa*) and creosote bush (*Larrea tridentata*). Both shrubs are regularly spaced across the landscape due to their ability to secrete compounds that inhibit the root growth of neighboring plants. Walk farther past the falls trailhead and the plant diversity expands. Tucked in the basalt boulders are vibrant displays of apricot mallow (*Sphaeralcea ambigua*) and purple Mojave aster (*Xylorhiza tortifolia* var. *tortifolia*). Look down and see a splendid array of exquisite “belly flower”, such as the desert star (*Monoptilon belliodora*). It helps to lie on your belly to get a good look at these!

Can you Find?

Thistle sage (*Salvia Carduacea*): Tall, erect stems and showy purple flowers protruding from spiny, white-wooly-coated bracts characterize this mint-family species. The Fossil Falls occurrences of thistle sage represent the most northern and western distribution of this species in California.



Holly dandelion (*Glyptopleura marginata*): This ground-hugging flower has white-rimmed and finely scalloped leaves and is topped with a single, showy yellow dandelion flower. When these are numerous, they look like little yellow saucers and glow atop the red cinder substrate that surrounds Fossil Falls.



Plants and People

Most of the archaeological materials found in the Fossil Falls vicinity reflect a cultural adaptation to the desert environment. The rock-ring features in this area supported conical brush or tule structures that served as shelter for only a few weeks or months of the year. The need for mobility as various plant foods ripened at different localities made permanent structures impractical.

The surrounding desert also contained the raw materials necessary for hunter-gatherers. The black scar seen on the dome-shaped hill to the east is a mile-long seam of volcanic glass, or obsidian. Obsidian was used almost exclusively in the manufacturing of stone tools such as projectile points, knives, and scrapers. The large scatters of obsidian flakes seen in the Fossil Falls vicinity are the by-products of this stone-tool manufacturing.

Alabama Hills

Details

- **Directions:** Take Highway 395 to Lone Pine. Turn west at the stoplight onto Whitney Portal Road. Drive 2.5 miles to Movie Road and turn right. Follow this well-maintained dirt road for 1.5 miles and park on your left to access the Arch Trail (a halfmile loop walk) or stay right to drive through the Alabama Hills (another eight miles north) to exit onto Highway 395.
- **Location:** GPS coordinates (UTM NAD83) for turnoff to Movie Road:
Easting: 400824 **Northing:** 4050607
- **USGS Quad Map:** Lone Pine.
- **Elevation:** 4,610 feet (1,383 meters).
- **Habitat(s):** Great Basin sagebrush steppe/Mojave scrub.
- **Landscape:** Dramatic rock outcrops interspersed by upland and riparian communities. Backdrop of Mt. Whitney and the Sierra range.
- **Facilities:** Full facilities nearby in Lone Pine. Visitor Center south of Lone Pine with restrooms, exhibits, bookstore.

Description

The Alabama Hills is a landscape of breathtaking geologic contrasts. The glacially carved backdrop of the Sierra, which includes Mt. Whitney, is graced below by an expanse of rounded granitic outcrops replete with arches and caves. There are two main rock types exposed in the Alabama Hills: one is an orange, weathered, metamorphic volcanic that is 150-200 million years old, and the other is 90-million-year-old granite that has weathered into oddly shaped large boulders. Many of these boulders stand on end due to a type of spheroidal weathering that molds and cracks the numerous vertical rock joints.

The 30,000-acre Alabama Hills received its name from a Confederate warship. Prospectors sympathetic to the Confederate cause named their mining claims after the C.S.S. Alabama, and eventually the name stuck to these unique hills. The scenic rock formations have been the setting for many commercials and movies, including Ironman and How the West Was Won.

The well-drained granitic soils surrounding the pantheon-like rock outcrops support a mix of Great Basin and Mojave species. Mojave asters (*Xylorhiza tortifolia* var. *tortifolia*) grace the southern entrance to the Alabama Hills, adding a lavender contrast to the subtle green of the common allscale (*Atriplex polycarpa*) and yellow mounds of bush sunflower (*Encelia actoni*). Tucked on ledges and on steeper slopes is the signature species for the Alabama Hills: the scarlet milk-vetch (*Astragalus coccineus*). A member of the pea family with a low-growing habit and large, bright-red flowers, it awakens the hills in early spring.

Flower Facts

Verdant passages of desert olive (*Forestiera pubescens*), yellow willow (*Salix lutea*), and common reed (*Phragmites australis*) are found throughout the Alabama Hills. Seeps and springs are also common and are home to rare plants such as the Inyo County star tulip (*Calochortus excavatus*) and Owens Valley checkerbloom (*Sidalcea covillei*). These oases are important for neotropical birds that pass through the Owens Valley, and they provide an important source of water, food, and shelter for a variety of desert denizens.

Can You Find?

Evening snow (*Linanthus dichotomus ssp. dichotomus*): You'll have to rise early or stay until dusk to see this plant in the phlox family (*Polemoniaceae*). The five creamy white petals of evening snow unfurl only at dusk and smell like spicy vanilla. During midday, look for the tightly whorled petals, almost invisible atop a thin stem.



Plants and People

In some years, the Alabama Hills showcase powder-blue swaths of the wild hyacinth (*Dichelostemma capitatum ssp. capitatum*). This geophyte (a plant that has distinct bulbs or tubers) was one of the most coveted plant foods of Owens Valley Indians. Some of the starchy bulbs were steam-roasted, while others were dried for later use. There is also evidence of historic cultivation of this species. "Taboose"; is the Paiute name for wild hyacinth.

Mazourka Canyon

Details

- **Directions:** From the south end of Independence, go east on Mazourka Canyon Road and follow it for 7.2 miles to the mouth of the canyon.
- **Location:** GPS coordinates (UTM NAD83) for entrance to Mazourka Canyon:
Easting: 400705 **Northing:** 4074238
- **USGS Quad Map:** Bee Springs.
- **Elevation:** 4,409 feet (1,322 meters).
- **Habitat(s):** Desert/Mojave scrub.
- **Landscape:** Canyons and desert washes.
- **Facilities:** Full facilities nearby in Independence.

Description

The spectacular entrance to Mazourka Canyon reveals geologic processes dating back to the Mississippian and Devonian periods (323-417 million years ago), also known as the period of fish--look for fossils! The sculpted waves of metamorphic rock also indicate the immense seismic forces that shaped the Inyo mountain range. The Inyo Mountains, in contrast to the Sierra Nevada, are dominated by calcareous (high carbonate) soils, which enhance water-holding capacity and provide textural qualities that encourage the presence of such life forms as cryptobiotic soil crusts, a soil/vegetation matrix comprised of both lichen and algae species. Recent studies indicate that biotic soil crusts act as immense carbon sinks in otherwise carbon-poor desert ecosystems and play a critical role in keeping soils free from invasive non-native annual grasses.

The alluvial fans that grace the canyon entrance support a mix of plants with varied form and niche. Mounds of bush sunflower (*Encelia actoni*) and yellow Shockley goldenhead (*Acamptopappus shockleyi*) contrast with an understory replete with cream-colored brown-eyed primrose (*Chylismia claviformis*) and purple bursts of showy gilia (*Gilia cana*). As you travel up the canyon, notice the diversity of cactus species that grow here: cottontop (*Echinocactus polycephalus* var. *polycephalus*), hedgehog cactus (*Echinocereus engelmannii*), Mojave mound cactus (*Echinocereus mojavenensis*), beavertail cactus (*Opuntia basilaris* var. *basilaris*), and Mojave prickly pear (*Opuntia polyacantha* var. *erinacea*).

Flower Facts

The wide variety of habitats and soil types that occur in Mazourka Canyon enables many plant species to reach their distributional limits in the Eastern Sierra. Examples include broad-leaved gilia (*Aliciella latifolia* ssp. *latifolia*) and desert five-spot (*Eremalche rotundifolia*) both more common in Death Valley. A variety of plants in the buckwheat family (*Polygonaceae*) are also found here and come in a variety of interesting forms such as the oddly shaped pagoda buckwheat (*Eriogonum rixfordii*) and bird's-nest buckwheat (*Eriogonum nidularium*). One of the most distinct buckwheats is the desert trumpet (*Eriogonum inflatum*). The green stems account for 66-77 percent of the entire plants photosynthetic surface area. Higher water-use efficiency in the stems of desert trumpet is attributed to both conservative water-use patterns and to their vertical orientation, allowing stems to remain photosynthetically active longer into the dry season.

Can you Find?

Mojave mound cactus (*Echinocereus mojavensis*): Perched high on the rock ledges, the red-orange blooms of this cactus will catch your eye. The mound-like form covered with finely textured spines can be large and often consists of more than 100 individual stems.



Bush peppergrass (*Lepidium fremontii*): The honey-sweet fragrance of this flowering woody plant often lets you know you're near it, and the bright-white, four-petaled blooms let you know it's in the mustard family.



Plants and People

One might not think that this dry desert canyon would offer much sustenance for hunter-gatherers, but tucked up on the rock ledges are vigorous stands of desert tomato (*Lycium andersonii*), which bear numerous edible red and juicy fruits. The diversity of cactus species also offered seeds and pulp for medicinal uses; even the inflated stems of the desert trumpet were used as pipes. Pinyon nuts collected from the one-leaved pinyon pine (*Pinus monophylla*) that grows on the higher benches and slopes of the Inyo Mountains offered one of the most nutritionally important food items.

Division Creek

Details

- **Directions:**

Division Creek: From southbound Highway 395 approximately 13 miles south of Big Pine, turn right on Aberdeen Road toward Goodale Creek campground. Turn left on Tinemaha Road at Aberdeen, then right on Division Creek Road (signed), heading west. From northbound Highway 395, turn left on Sawmill Creek/Black Rock Road approximately 8.5 miles north of Independence, then right on Tinemaha Road, then left on Division Creek Road. The road turns to dirt at the Division Creek Powerhouse, where the bush lupines begin.

Oak Creek: From Highway 395 approximately two miles north of Independence, take Mt. Whitney Fish Hatchery Road to the west. Past the Fish Hatchery, the site begins as the road splits into North and South Fork Oak Creek roads.

- **Location:** GPS coordinates (UTM NAD83) for Division Creek Road/Tinemaha Road intersection, and for Mt. Whitney Fish Hatchery Road where it splits to the North and South Forks of Oak Creek.

Division/Tinemaha Easting: 388066 **Northing:** 4088334

USGS Quad Map: Aberdeen

Oak Creek Easting: 388894 **Northing:** 4076698

USGS Quad Map: Independence

- **Elevation:** 4,000 to 6,000 feet (1,200 to 1,800 meters).
- **Habitat(s):** Desert scrub, sagebrush-bitterbrush scrub, oak woodland, riparian.
- **Landscape:** Alluvial fans cut by riparian corridors flowing out of the Eastern Sierra escarpment. Recent fire and flood disturbances. Lava fields and cinder cones.
- **Facilities:** Sawmill Pass and Baxter Pass trailheads, restaurant and camping in Aberdeen.

Description

Division Creek and Oak Creek are two of the many streams that flow from the high elevations of the Sierra Nevada down to the Owens River --a drop of up to 10,000 feet below the peaks. The sloping alluvial fans form at the mouths of canyons where the creeks have deposited tons of debris over thousands of years. At the foot of the escarpment is a fault zone where volcanic activity has formed cinder cones and lava flows. At Division Creek there is a large lava field on the north side of the road, and the Sawmill Pass trail traverses a cinder cone south of the road.

The streams here are unique in that they support species not typically found in the Eastern Sierra. The interior live oak (*Quercus wislizeni*) and California black oak (*Quercus kelloggii*), more commonly seen on the west side of the Sierra Nevada, and narrow-leaved cottonwood (*Populus angustifolia*), typically found farther east in the Great Basin and Rocky Mountains, all occur here. Other trees growing along these streams include the canyon live oak (*Quercus chrysolepis*), willows (*Salix* spp.), and other cottonwoods (*Populus* spp.). Shrubs associated with the riparian corridors include California buckthorn, or coffeeberry (*Frangula californica*); wild rose (*Rosa woodsii*); and gooseberry (*Ribes* spp.).

Disturbance in the Desert

The Division Creek and Oak Creek areas are in different stages of recovery from fires. Division Creek burned in April 1999, the Goodale area just north of Division in 2006, and Oak Creek in July 2007. Oak Creek subsequently experienced a very heavy localized rain event in the summer of 2008. Soils laid bare by the recent fire became mobilized in the stream channels, causing Oak Creek and its tributary drainages to overflow, carrying masses of sediment down the slopes and across Highway 395.

Notice the difference in recovery between the flood and fire areas. Fires often leave behind living root-crowns to re-sprout the following spring, or seeds to germinate when conditions are favorable. Some species even require the heat of fire to aid in germination. In contrast, the flood debris buried many seeds and root crowns too deeply for them to survive. Without human intervention, recovery in this area will have to wait for seeds to move into the area via wind, water, or wildlife.

Flower Facts

The common large shrubby lupine at Division and Oak creeks is the Inyo bush lupine, or grape-soda lupine (*Lupinus excubitus* var. *excubitus*). You'll understand the origin of this name as the fragrance of these beautiful plants fills the air during the May bloom.

Lupines can be recognized by their distinctive palmately compound leaves, shaped somewhat like a hand. The flowers, arranged along the tall stems, are often purple with a white or yellow patch that turns dark red or purple after the flowers have been pollinated. After fires on the alluvial fans, the grape-soda lupines are among the first shrubs to appear. They provide beautiful spring displays for many years as the sagebrush and bitterbrush are reestablishing.

Can You Find?

Owens Valley penstemon (*Penstemon patens*): Look closely into the "throat" of the flowers on this plant; use a magnifier if you have one. Penstemons, also called beardtongues, have an infertile stamen, called a staminode, arising from within the throat of the corolla (the petals). The staminode of many penstemon species is covered with hairs, appearing as a hairy, or bearded, tongue-hence the common name for the genus.



Sand blossoms (*Linanthus parryae*): Seemingly perched on the surface of the ground, sand blossom flowers can completely obscure the short stem and tiny leaves of the plant. In a wet year they carpet the ground in places, providing amazing colorful displays against the desert soils. It's not unusual to find patches of sand blossoms with blue, lavender, and white flowers all mixed together.



White Mountains

Details

- **Directions:** From the intersection of Highways 395 and 168, at the north end of Big Pine, travel east on Highway 168 for 13 miles. Turn left (north) onto White Mountain Road, where this site begins. It is 10 miles from this intersection to the Schulman Grove. This is a narrow, winding drive from the Owens Valley floor, so please be cautious and watch your speed. Don't overheat your brakes; use gears to help you descend.
- **Location:** GPS coordinates (UTM NAD83) for intersection of Westgard Pass Road and White Mountain Road:
Easting: 397946 **Northing:** 4126805
- **USGS Quad Map:** Westgard Pass.
- **Elevation:** 7,300 feet (2,200 meters) at Westgard Pass to 10,100 feet (3,050 meters) at Schulman Grove.
- **Habitat(s):** Pinyon-juniper woodland, sagebrush scrub communities, bristlecone pine forest, limber pine forest.
- **Landscape:** Wide vistas east toward the Great Basin and Mojave Desert and west toward the Sierra Nevada; large expanses with diverse geology and topography.
- **Facilities:** Pinyon Picnic Area; Grandview Campground; Schulman Grove Visitor Center with restrooms, nature trails, exhibits, bookstore, and ranger-led programs. No water available.

Description

As with so many sites in the Eastern Sierra, you can travel through multiple life-zones within a short drive in the White Mountains. You will climb 3,000 feet in elevation just to reach the lower elevation of this viewing area! From Westgard Pass you will climb another 3,000 feet to reach Schulman Grove, the upper end of this site. Notice the vast stands of pinyon pine in the vicinity of Westgard Pass and elsewhere along the way. Their nutritious nuts have been an important food source for local Native American tribes for thousands of years.

At the Pinyon Picnic Area, take a stroll around the nature trail. The light- and dark-gray-colored carbonate rocks provide a unique habitat for many species. Look for differences in the suite of plants you see on these rocks versus those growing on the darker brown soils. You will find more evidence of this affinity of certain plant species to specific substrates as you explore the Schulman Grove. Indeed, the bristlecone pine (*Pinus longaeva*) is found on dolomite, the light-colored calcium-magnesium carbonate rock, but is generally absent from the darker-brown sandstones, where sagebrush communities (*Artemisia spp.*) dominate. The Bristlecone Cabin Trail to the Mexican Mine offers some of the best wildflower viewing in the vicinity of Schulman Grove.

Records of Change

Due to their longevity and decay-resistant wood, bristlecone pines have long been used to study variations in climate over time, and much climate-related research is still ongoing here. Visit the exhibits at Schulman Grove for an interesting look at the history of research in the bristlecone pine forest and what the trees can tell us about past climatic conditions here. What will happen to the bristlecone pine with the current and projected changes in climate? Will warmer temperatures create a more hospitable environment for insects and disease in the bristlecone pine

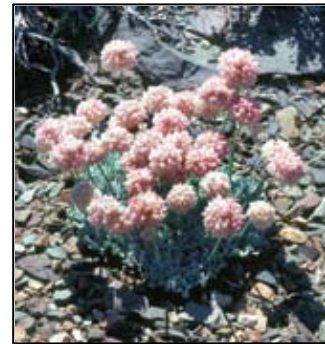
forest? Will the White Mountains experience drought or increased summer rains, and what effect will that have on these high-elevation forests? There are many unanswered questions as to the fate of the bristlecone pine over the coming years.

Flower Facts

As noted above, the carbonate soils found in many areas in the White Mountains provide a unique habitat for several species. These soils contain different minerals than other soils in the area, and the lighter color of the substrate can affect temperature and available moisture, determining which plant species will grow here. The Westgard penstemon (*Penstemon scapoides*), dolomite milk-vetch (*Astragalus kentrophyta* var. *tegetarius*), and Lemmon's rubberweed (*Hymenoxys lemmonii*) are a few of the carbonate species you can see at either the Pinyon Picnic Area or Schulman Grove, and elsewhere in the White Mountains.

Can You Find?

Cushion buckwheat (*Erigonum ovalifolium*): As the name suggests, this plant looks like a small cushion set down on the ground surface. "Ovalifolium" also tells us something about this plant (hint examine the leaf shape). Stems rising up to six inches above the cushion support clustered heads of whitish, pink, or soft-yellow flowers.



Pinyon Streptanthus (*Streptanthus cordatus* var. *cordatus*): Also called jewel flower for its small, urn-shaped flowers, this plant can reach more than two feet tall but somehow still manages to blend in with its surroundings, particularly if it not in bloom. When you spot the yellow to purple flowers, look below along the stem for the clasping heart-shaped leaves. Later in the season the flowers yield to conspicuous seedpods, held upright from the stem.



Fish Slough

Details

- **Directions:** From the intersection of Highway 395 and Highway 6 in Bishop, take Highway 6 until you reach Five Bridges Road. Follow Five Bridges Road until it turns to dirt and intersects with Fish Slough Road, Casa Diablo Road, and Chalk Bluff Road. At this intersection are informational signs welcoming you to the area. Access Fish Slough via Fish Slough Road; take Casa Diablo Road to explore the Volcanic Tableland. Chalk Bluff Road will take you along the base of the Tableland. You can stop anywhere you find an appropriate pullout.
- **Location:** GPS coordinates (UTM NAD83) for intersection of Five Bridges and Casa Diablo roads: **Easting:** 375283 **Northing:** 4142370
- **USGS Quad Map:** Fish Slough.
- **Elevation:** 4,198 feet (1,280 meters).
- **Habitat(s):** Desert scrub, alkali meadow, wetland.
- **Landscape:** Volcanic flow and valley between dramatic horst and graben formation.
- **Facilities:** Full facilities nearby in Bishop.

Description

The Fish Slough ecosystem is located in the northern end of the Owens Valley along the eastern edge of the Sierra Nevada in the transition between the Mojave Desert and Great Basin floristic provinces. The wetland that comprises Fish Slough is bounded by the Volcanic Tableland, an area formed by the cataclysmic explosion of the Long Valley Caldera 750,000 years ago.

The Bishop Tuff - a porous white, pink, and tan rock that makes up the Volcanic Tableland's derived from the pyroclastic flow of the caldera. This flow later was warped and cracked by faulting, which lifted some parts and dropped others. The small, round hills that dot some parts of the Tableland are the result of fumaroles of hot water and steam that vented from the cooling ash flow and hardened the tuff so that it resisted erosion. One of the most active faults in the Owens Valley runs along the east side of Fish Slough and the Volcanic Tableland.

Water percolates through the Tableland's porous rock to emerge from three perennial, free-flowing freshwater springs. Fish Slough, with 126 wetland plant species, has one of the richest wetland floras in the Great Basin and includes eight rare species, such as the Fish Slough milk-vetch, that occur nowhere else in the world.

Flower Facts

If the winter and early-spring rains have been plentiful, the Volcanic Tableland and slopes bounding Fish Slough can be carpeted by colorful swaths of Venus blazing star (*Mentzelia nitens*), yellow cups (*Chylismia brevipes*), and magenta-colored narrow-leaved nama (*Nama depressum*). Along the eastside road of Fish Slough, in the early-morning hours, the hillsides are covered with lavender-pink mounds of the rose four-o'clock (*Mirabilis alipes*). Driving along Chalk Bluff Road, the steep escarpment of the Volcanic Tableland can be covered with showy white and yellow primrose (*Chylismia* spp., *Camissonia* spp.), Nevada cryptantha (*Cryptantha nevadensis*), purple-flowered chia (*Salvia columbariae*), and the indigo blooms of the shrub indigo bush (*Psoralea arborescens* var. *minutifolia*).

Can You Find?

Alkali shooting star (*Dodecatheon pulchellum*): Look for this plant in the alkali meadows along the eastside road of Fish Slough. It features vibrant magenta flowers atop long, straight stems with smooth-margined leaves.



Spiny menodora (*Mendora spinescens*): Look for this plant in the rocky Bishop Tuff of the Volcanic Tableland. The low-growing, spiny, green-angled stems are often covered first with tiny, creamy white flowers and then followed with clusters of round, reddish-green fruits. Spiny menodora is a common Mojave scrub species in the olive family.



Plants and People

Fish Slough's botanical and faunal resources provided a real abundance for Native Americans. Food sources included wetland bulrush species (*Schoenoplectus* spp.) as well as desert scrub plant resources such as Indian ricegrass (*Stipa hymenoides*) and Great Basin wildrye (*Elymus cinereus*), which were harvested and transported in baskets woven from willow branches.

Rock Creek

Details

- **Directions:** From Highway 395 at Tom's Place, approximately 24 miles north of Bishop, drive up Rock Creek Road. Depending on the time of year, flowers may still be blooming just above Tom's Place, but you will want to continue to the end of the road at Mosquito Flat, with stops along the way. Be mindful of traffic if you're wildflower watching along the roadside.
- **Location:** GPS coordinates (UTM NAD83) at junction of Highway 395 and upper Rock Creek Road:
Easting: 351866 **Northing:** 4158588
- **USGS Quad Map:** Tom's Place
- **Elevation:** Approximately 7,000 feet (2,150 meters) at Tom's Place, 10,200 feet (3,100 meters) at Mosquito Flat, and 11,000 feet (3,350 meters) in Little Lakes Valley, with higher peaks above.
- **Habitat(s):** Sagebrush-bitterbrush scrub, pinyon woodland, mountain mahogany scrub, Sierra juniper woodland, lodgepole pine forest, subalpine forest, aspen, streamside riparian communities, meadows.
- **Landscape:** Classic High Sierra canyon with glacially carved cirques beyond the trailhead. The road follows Rock Creek through the canyon, flanked by steep hillsides and rock walls.
- **Facilities:** Rock Creek Canyon has several campgrounds, two lodges, and a trailhead with restroom facilities at Mosquito Flat. Restaurant, lodge, and store at Tom's Place.

Description

Rock Creek Canyon exhibits some classic Sierra geology with granite cliffs and spires topping the slopes, particularly as you reach the upper end of the canyon. Rock Creek Road follows the river canyon for roughly nine miles, with several places to pull off along the way. With an elevation gain of more than 3,000 feet from Tom's Place to Mosquito Flat, you can experience a diverse array of plant communities in a very short time. There are also lovely displays of fireweed (*Chamerion angustifolium* ssp. *circumvagum*), Sierra rein-orchid (*Platanthera dilatata* var. *leucostachys*), Kelley's tiger lilies (*Lilium kelleyanum*), and other beauties where water runs along the road.

If you're prepared to walk a bit, the trail into Little Lakes Valley from Mosquito Flat at the end of the road is a relatively easy hike, rolling and sometimes level, especially compared to many of the other trails in the region. Little Lakes Valley is a large glacial cirque dotted with lakes and flower-filled meadows. It would be hard to imagine a more beautiful spot that takes so little effort to reach. Amble through the meadows and along the streams and enjoy the colorful collection of subalpine wildflowers.

To Each His Own...Habitat

As you turn off of Highway 395 onto Rock Creek Road, pinyon woodlands surround you, defined by the short, rounded, one-leaved pinyon (*Pinus monophylla*), one of the most common pine trees in the Eastern Sierra. Mountain mahogany scrub (*Cercocarpus ledifolius*) and open

stands of magnificent Sierra juniper (*Juniperus grandis*) cover the slopes farther up the canyon. As you continue to climb, extensive Sierra lodgepole pine (*Pinus contorta* ssp. *murrayana*) communities dominate in the Pine Grove area.

If you choose to hike up into Little Lakes Valley beyond the road's end, you will enter the upper subalpine and alpine habitats, with whitebark pine (*Pinus albicaulis*), limber pine (*Pinus flexilis*), meadows, and vast talus slopes.

The wide range in elevation, different aspects, and resulting changes in temperature and precipitation affect which plant community occurs in any given area. Each of these communities supports a different combination of plants and animals adapted to the unique conditions found there. Some species, called generalists, live in many habitats, while others – specialists --are restricted to a narrower range of living conditions. Which group do you think humans belong to, generalist or specialist?

Flower Facts

It is not so much the flowers of the mountain mahogany (*Cercocarpus ledifolius*) that will catch your eye as it is the fruits. Called an achene (pronounced a-KEEN), the single-seeded fruit has a feathery plume attached at the top; indeed, “cercocarpus”; means” tailed fruit”. When the sun shines from behind these large shrubs, they almost appear to be glowing from the light filtering through the silky plumes. The effect can be quite stunning when viewed across an entire hillside. The plume curls as it dries on the plant, like a corkscrew, eventually aiding in planting the seed.

Can You Find?

Fireweed (*Chamerion angustifolium* ssp. *circumvagum*): This striking plant is topped by several long spikes of brilliant magenta flowers. The name “fireweed” comes from the ability of this plant to thrive following wildfires; imagine a large expanse of this beauty appearing on a recently blackened landscape!



Bull elephant's head (*Pedicularis groenlandica*): Once you find “bull elephant's head” and take a closer look at one of the many flowers arranged along the upright stem, you'll easily see how it got its name. Look for these delightful plants in meadows and other wet areas. You may also find the similar little elephant's head (*Pedicularis attolens*)



McGee Creek

Details

- **Directions:** Take the McGee Creek exit off of Highway 395, approximately six miles north of Tom's Place or eight miles south of the Highway 203 exit. Proceed to the parking lot at the end of the road. Use caution, as the road is narrow and winding.
- **Location:** GPS coordinates (UTM NAD83) at McGee Creek trailhead:
Easting: 340775 **Northing:** 4157531
- **USGS Quad Map:** Convict Lake.
- **Elevation:** 7,800 feet (2,380 meters).
- **Habitat(s):** Sagebrush-bitterbrush scrub, sagebrush scrub, riparian, aspen, talus.
- **Landscape:** Steep, glacially carved canyon with riparian corridor in the canyon bottom.
- **Facilities:** Paved parking lot, restrooms, and trailhead at road end, pack station and campground lower in the canyon.

Description

As you approach the trailhead for McGee Pass, your eyes will be drawn to the rocky canyon slopes above. The steep slopes you see as you look up the canyon provide a stunning display of colorful rocks, with an artist's palette of reds and grays arrayed in stripes and swirls.

Geologists use the term “metasedimentary”; to describe these rocks that dominate the landscapes of McGee and nearby Convict Creek canyons. The “sedimentary”; part of the term refers to how these rocks were originally formed: sediments accumulated on the ocean floor over millions of years and were later compressed and cemented into solid rock. Later, as molten rock began to rise through the earth, some of the sedimentary rock was heated enough that the minerals and texture were changed, or metamorphosed, from their original form - hence the term “;meta”sedimentary.

Of course, the wildflowers are also an important part of the artist's palette in the canyon. Amidst the slopes of gray-green sagebrush (*Artemisia tridentata*) and bitterbrush (*Purshia tridentata*) are splashes of yellow, red, purple, and white. At the peak of the blooming season, you can see paintbrush (*Castilleja* spp.), lupines (*Lupinus* spp.), milk-vetches (*Astragalus* spp.), hawksbeard (*Crepis* spp.), mule ears (*Wyethia mollis*), and more. While you're searching, don't miss the more subtle beauty of the native bunchgrasses. Though bright, showy colors are not their specialty, there is beauty in the form, texture, and muted greens of this ubiquitous group of plants.

A Different Shade of Green

In contrast with the overall gray-green cast of the sagebrush slopes are the stream- and spring-fed willow stands, black cottonwood riparian forest, and clusters of aspen scattered along the stream and the gentler canyon slopes. Watch for crimson columbine (*Aquilegia formosa*), great red paintbrush (*Castilleja miniata* ssp. *miniata*), and other moisture-loving plants in these areas.

The lush growth and cooler temperatures of these habitats attract many species of wildlife that use these areas for feeding, nesting, brood rearing, and rest. Feeding on the abundant insect life,

birds will nest in cavities in the soft wood of the cottonwood and aspen trees. Maybe you can spot a deer bed, noticeable by the soft vegetation laid flat from recent use.

Flower Facts

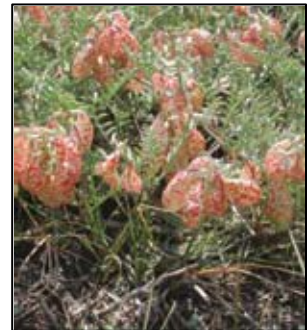
Walking up the trail a short way, you will encounter a large green shrub with long, pointed green leaves. This is the blue elderberry (*Sambucus nigra* ssp. *caerulea*). In summer, small white flowers appear on the ends of short branchlets, called “rays”. The rays support a large, flat-topped cluster of flowers. Later in the summer, these delicate flowers develop into blue-black berries. Though the berries themselves are edible, eating this plant is not recommended, as all other parts, including very small stems, can be poisonous under certain conditions.

Can You Find?

Woolly-pod locoweed (*Astragalus purshii*): This compact little mat has tiny leaflets covered with fine, cottony hairs, giving the entire plant a silvery gray look. True to its name, it develops fuzzy white seedpods resembling little cotton balls. You can also see lovely pink purple displays of this plant in May along Highway 395 near the Crowley Lake exit.



Whitney's locoweed (*Astragalus whitneyi*): In contrast to the woolly-pod locoweed, this species of locoweed is more sprawling and less hairy, with a greener appearance overall. The inflated pods, sometimes more than two inches long, are quite striking with their reddish-purple splotches.



Parker Bench

Details

- **Directions:** Approximately five miles south of Lee Vining, turn west from Highway 395 onto Highway 158, toward Grant Lake. Proceed for approximately 1.5 miles, then turn right onto the dirt road to Parker Lake. To reach the Parker Lake trailhead, follow the main dirt road for approximately three miles, not turning off onto intersecting roads along the way. If you want to stop sooner, just find a safe spot to park where the views suit you. Please keep your vehicle speed low to reduce dust and maintain control on the washboard surface.
- **Location:** GPS coordinates (UTM NAD83) at junction of June Lake Loop (Highway 158) and Parker Lake Road:
Easting: 314501 **Northing:** 4194403
- **USGS Quad Map:** June Lake.
- **Elevation:** 7,780 feet (2,370 meters) at Parker Lake trailhead.
- **Habitat(s):** Sagebrush-bitterbrush scrub, sagebrush scrub, riparian, aspen.
- **Landscape:** Towering peaks and glacial moraines on the western edge of the area, extending down to the volcanic craters and spacious views of the Mono Basin.
- **Facilities:** Dirt parking lot, trailhead at road end.

Description

The Parker Bench area is situated between the beautiful June Lake Loop and the Mono Basin National Forest Scenic Area. One of the more stunning aspects of this area is the stark contrast between adjacent landscapes.

To the west is the Sierra Nevada, with its massive rocky peaks. The scattered aspen groves offer an ever-changing scene as they progress from summer green to autumn gold to silver-black against the winter snow. The creeks flowing out from the canyon mouths are lined with lodgepole and Jeffrey pine, aspen, and willows, tracing a line through the sagebrush slopes and valleys. They follow the base of the glacial moraines, piles of rubble left behind as the glaciers retreated thousands of years ago.

Turn to the east and you are faced with another land - some say more lunar in appearance. The light-colored Mono Craters stand tall above the sagebrush basin, lined up as if sinking into or rising out of the lake. Note the stark contrast of Paoha and Negit islands in Mono Lake: Paoha with its glaring-white alkali soils, Negit with its dark volcanic rock. Add the changing hues and gemlike quality of the lake itself, and it is a landscape unlike any other.

Living History

Take some time to wander through one of the many quaking aspen (*Populus tremuloides*) stands in the area. Feel the smooth white bark of the aspen trees. This smooth bark made an excellent carving surface for Basque sheepherders that herded in this area beginning in the late 1800s. The names, dates, poetry, and images of these “arborglyphs” help us understand the history of these

people and their summer wanderings in the Eastern Sierra. This record is now disappearing, as aspen trees typically live only up to 100 years.

The Basque carvings were done carefully to prevent injury to the tree. Please resist the urge to carve; leave these beautiful trees as you find them and respect any Basque carvings you encounter.

Flower Facts

Two large flowering plants, similar in overall appearance, can be found here. In May and June, the large, yellow, daisy-like flowers of the mule ears (*Wyethia mollis*) and arrow-leaved balsamroot (*Balsamorhiza sagittata*) are impossible to miss. To distinguish between these two, compare the darker-green leaves of the arrowleaved balsamroot—so-named for the sagittate, or arrowheadshaped, leaf base—with the more gray leaves of the mule ears. The mule ears' leaves taper to a point at the base, with no sagittate lobes. Native Americans utilized the seeds of both of these plants for food, along with the thick taproot of the balsamroot.

Can You Find?

Wallflower (*Erysimum capitatum*): The showy clusters of yellow flowers will draw your eye to the wallflower. The genus name for this plant, *Erysimum*, stems from the Greek *eryomai*, meaning “to help or save,” for its reported medicinal properties. Native American tribes throughout the West used as a poultice and for stomach cramps and headaches, among other ailments.



Sulphur-flower (*Eriogonum umbellatum*): This common low, rounded shrub is named for the bright yellow- (or sulphur-colored) flowers. These flowers attract many pollinators, including bees, wasps, and flies. Once pollinated, flowers darken to a burnt orange, signaling to searching insects that the flower has already been visited. People made use of this plant as well: it was reportedly used as a treatment for colds and stomach aches by the Owens Valley Paiute.



East Mono Basin

Details

- **Directions:** This site extends for approximately 11 miles along Highway 120 from the Mono Basin National Forest Scenic Area in the west to the Sagehen Summit area in the east. It can be reached by traveling east on Highway 120 from Highway 395 for approximately five miles to the turnoff to South Tufa, or by traveling west from Benton on Highway 120 for approximately 31 miles to Sagehen Summit. Use caution when traveling on secondary roads in this area, as vehicles can easily be stuck in the soft pumice soils.
- **Location:** GPS coordinates (UTM NAD83) at the turnoff from Highway 120 to Mono Lake Tufa Reserve (South Tufa, Test Station Road):
Easting: 322161 **Northing:** 4199590
- **USGS Quad Map:** Lee Vining.
- **Elevation:** 6,600 feet (2,010 meters) at turnoff to South Tufa, 8,140 feet (2,480 meters) at Sagehen Summit.
- **Habitat(s):** Pumice flats, Jeffrey pine forest, sagebrush bitterbrush scrub
- **Landscape:** Open pumice flats surrounded by sagebrush bitterbrush hills and Jeffrey pine forest.
- **Facilities:** Restrooms nearby at South Tufa, interpretive kiosk at Mono Mills.

Description

A thick layer of pumice underlies the vegetation of the eastern Mono Basin, a result of volcanic eruptions of the Inyo and Mono craters from 700 to 10,000 years ago. The well-drained, light-colored soils present special challenges for the plant communities that grow here.

As you travel east on Highway 120, you will pass through part of the largest contiguous Jeffrey pine forest (*Pinus jeffreyi*) in the world. A fire burned through a portion of the area in 2002, blackening trees but resulting in a flush of native grass growth. The Indiana Summit Research Natural Area, just to the south of the highway, is set aside for the study and preservation of this Jeffrey pine ecosystem. Stop at the kiosk near Mono Mills for some interesting historical and ecological information about this particular area.

As you continue east toward Sagehen Summit, you will drop out of the Jeffrey pine forest and into the sagebrush bitterbrush hills and stark pumice flats - one of the characteristic features of this area. Plant species specially adapted to this unique habitat color the light pumice soils with blues, pinks, and yellows.

Toward the eastern end of this viewing area, east of Sagehen Summit, are sweeping views of the Glass Mountains to the south and the Granite Mountain area to the northeast.

Special Place, Special Plants

There are two plant species that grow in the pumice flats of Mono County and nowhere else on Earth: the Mono milk-vetch and the Mono Lake lupine. What causes a species to occur in only one small area? These plants may be specially adapted to the unique environment of the pumice flats, or perhaps it's the lack of competition from other species that are unable to tolerate the harsh soils or intense sunlight.

Sometimes special management is needed to help ensure the species' persistence over the long term, but for many rare species, we know very little about their habitat requirements, life history, pollinators, or other basic information. Please help to protect these unique plants: keep vehicles on designated roads and walk gently when exploring these areas.

Flower Facts

The gray-green leaves of the Mono milk-vetch (*Astragalus monoensis*) are not easily seen against the backdrop of light-gray pumice. Even when this plant has its delicate pinkish-white blossoms, it may still be overlooked by the less observant. Look for the long branches, lined with tiny leaflets, that hug the ground surface as they grow out from the root crown of the plant. Mono Lake lupine (*Lupinus duranii*) is slightly more abundant than the milk-vetch, found in more of the pumice habitats throughout the region. Though still mostly less than six inches tall, it is more easily spotted, having showy violet flowers arranged along an upright stem. If the conspicuous seedpods are developed, look for tiny holes bored into the fruit where ants or other insects have tunneled in for a snack.

Can You Find?

Pussypaws (*Calyptridium umbellatum*): Several green, spoon-shaped leaves radiate out from the central point of the plant, as do the flowering stems punctuated by the “pussypaws,” clusters of tiny white-and-pink flowers. The flowering stems lie very flat when it's cold, but rise up well off the ground as the temperature rises—a sort of local thermometer.



Tioga Pass

Details

- **Directions:** From Highway 395 just south of Lee Vining, head west on Highway 120 toward Tioga Pass. The site extends along Highway 120 from Ellery Lake to Tioga Pass and the surrounding area.
- **Location:** GPS coordinates (UTM NAD83) at east end of Ellery Lake:
Easting: 303777 **Northing:** 4201015
- **USGS Quad Map:** Mount Dana, Tioga Pass.
- **Elevation:** 9,477 feet (2,888 meters) at Ellery Lake, 9,943 feet (3,030 meters) at Tioga Pass, neighboring peaks more than 12,000 feet (3,660 meters).
- **Habitat(s):** Lodgepole pine forest, whitebark pine, aspen, riparian communities, subalpine meadows, alpine rocky habitats.
- **Landscape:** Expansive subalpine and alpine landscapes with lakes, tarns, and meadows flanked by towering peaks.
- **Facilities:** Along Tioga Pass Road (Highway 120) there are several campgrounds, the Nunatak Nature Trail, the Bennettville Trail, restroom facilities, and a lodge. A full range of facilities is available in Lee Vining.

Description

The Tioga Pass area is truly awe-inspiring, as every direction presents a spectacular view. There are several spots along the way to pull safely off the highway and take a stroll. The Nunatak Nature Trail, only a quarter-mile long, and the Bennettville Trail, approximately one mile to the old mining-town site, both offer opportunities to get out and stretch your legs, take in the views, and get a closer look at the subalpine flowers.

You can scramble among the rocks in search of the hardy plants that grow tucked into the shelter of crevices and cracks, using what little soil they can find. Rock cress (*Arabis* spp.), drabas or whitlow grass (*Draba* spp.), shieldleaf (*Streptanthus tortuosus*), and others often make their home in these seemingly inhospitable spots.

An entirely different suite of plants can be found in the meadows and along the lakeshores and streamsides. Notice the lush green vegetation here - a sign of the extra water available to plants in these sites. Willows (*Salix* spp.) and the grass-like sedges (*Carex* spp.) and rushes (*Juncus* spp.) dominate these wet areas. Life Near the Top

Life Near the Top

Learn the story of the nunataks, told on the signs along the Nunatak Nature Trail. The plant species you see here and elsewhere along upper Tioga Pass Road had to recolonize most of the area when the glaciers retreated and exposed the soil once again to sunlight. Wind, water, birds, and other wildlife helped to disperse seeds to distant locations, carrying them from nunataks or other non-glaciated refugia to newly exposed sites where the seeds could germinate and grow into adult plants.

Conditions are harsh here: shallow, nutrient-poor soils, a very short growing season, intense solar radiation, and strong, cold winds all contribute to the need for special adaptations to make it in

this environment. Look for plants with a low growth form, evergreen leaves, or hairs or a waxy coating on the leaf surface. All of these characteristics help plants survive here.

Flower Facts

The heath family (*Ericaceae*) is well represented in high elevation habitats. With help from fungi, plants in this family are able to utilize the scant nutrients in the acidic soils where they are typically found. Dwarf bilberry (*Vaccinium cespitosum*) carpets the ground, relying on its low growth form to survive here at almost 10,000 feet. Labrador tea (*Rhododendron columbianum*), a medium-size shrub often found adjacent to water, has a different strategy. Study the leaves to discover some of this plant's survival tricks.

Can You Find?

Sierra gentian (*Gentianopsis holopetala*): The Sierra gentian's purplish, four-petaled flowers brighten high-elevation meadows late into the summer, continuing to bloom as late as September. Other equally striking Eastern Sierra members of this family include hiker's gentian (*Gentianopsis simplex*), alpine gentian (*Gentiana newberryi*), felwort (*Gentiana amarella* ssp. *acuta*), Dane's dwarf gentian (*Comastoma tenellum*), and Inyo gentian (*Frasera puberulenta*).



Whorled penstemon (*Penstemon heterodoxus*):

The sticky hairs covering the blue-purple flowers, and the arrangement of the flowers in whorls, help to distinguish this penstemon from other similar penstemons that can be found in the area. Look for this species in the meadow area along the Nunatak Nature Trail.



Bodie Hills

Details

- **Directions:** From Highway 395 18 miles north of Lee Vining or 7 miles south of Bridgeport, take the Bodie Road (Highway 270) east for 13 miles toward Bodie State Historic Park. After 10 miles, the road changes from pavement to maintained dirt. Stop to explore anywhere along this road where you find an appropriate turnout. For further exploration in the Bodie Hills, try Geiger Grade Road, which heads north out of Bodie State Historic Park. Geiger Grade Road can be rough and may be blocked by snow drifts well into the summer season, so high-clearance vehicles are recommended.
- **Location:** GPS coordinates (UTM NAD83) for turnoff to Bodie State Historic Park from Highway 395:
- **Easting:** 307743 **Northing:** 4227547
- **USGS Quad Map:** Bridgeport
- **Elevation:** 6,000 to 9,500 feet (1,800 to 2,850 meters).
- **Habitat(s):** Great Basin sagebrush-steppe, pinyon-juniper woodland, aspen, riparian Landscape: Rolling sagebrush- and pinyon-covered hills with two prominent peaks (Potato Peak and Bodie Mountain).
- **Facilities:** Restroom, parking at Bodie State Historic Park, full facilities in Bridgeport.

Description

The location of the Bodie Hills on the western edge of the Great Basin and eastern edge of the Sierra Nevada drives the occurrence and position on the landscape of the 14 different plant communities that make up this unique area. The Miocene and Pliocene epochs (from about 28 million to 2 million years ago) were when most of the Bodie Hills topography was formed. Ancient cinder cones such as Beauty Peak in the northeastern part of the Bodie Hills reflect this volcanic period. The suite of different soils - rocky, dwarf sagebrush-dominated sites to loamy basins that support Great Basin wildrye (*Elymus cinereus*) - forms the matrix of plant diversity in the Bodie Hills. In spring and early summer, the mountain sagebrush and dwarf sagebrush plant communities erupt with white and blue stands of lupine (*Lupinus argenteus*), indigo-colored Anderson's larkspur (*Delphinium andersonii*), yellow hawksbeard (*Crepis* spp.), and carpets of Coville's phlox (*Phlox condensata*).

As one traverses the Bodie Hills, the landscape unfolds with subtle textural and color changes of gently rolling sagebrush-covered hills, meadows, aspen groves, and conifer stands (pinyon, juniper, limber, and lodgepole pine). These diverse plant communities in turn support a rich fauna, including a suite of sagebrush-dependent species such as the greater sage grouse, pronghorn antelope, pygmy rabbit, and sage sparrow. Rare plants are tucked away in these hills as well and range from the tiny yellow Mono phacelia (*Phacelia monoensis*) to the Masonic mountain jewelflower (*Streptanthus oliganthus*), which inhabits the granitic outcrops in the northwest portion of the Bodie Hills.

Flower Facts

In springtime, watch for the showy white to pink flowers of the bitterroot (*Lewisia rediviva*). These lovely blooms appear to rest on the ground surface, hiding the tiny leaves and short stem below. Collected during the Lewis and Clark expedition and later named for Meriwether Lewis,

bitterroot was already well known to Native American people. The roots, able to store water and thus withstand periods of drought, were an important food source for many tribes throughout the West.

Can You Find?

Pincushion penstemon (*Penstemon procere* var. *formosus*): Look for clusters of short, flowering stems rising above a leafy mat. The blue-purple flowers with a white throat are whorled around the stems.



Coyote mint (*Monardella odoratissima*): A common resident of the Eastern Sierra, coyote mint is easily recognized by its strong odor and plentiful clusters of lavender flowers. Try rubbing some leaves between your fingers to smell the distinctive aroma.



Plants and Climate

What's a peatland doing in the Bodie Hills? The Bodie Hills peatland, or fen, was discovered by Tim Messick in 1981 during fieldwork for his master's thesis on the flora of the Bodie Hills. The fen is located in Cinnabar Canyon, which is close to several hydrothermally active areas. What distinguishes this site from other "wet meadow" sites in the Bodie Hills are two unusual plants: *Sphagnum fimbriatum*, or peat moss, and *Kalmia polifolia*, or alpine laurel - a plant more common in the high-alpine meadows of the Sierra Nevada. Peatlands are unusual in North America and especially rare in California. During the repeated glaciations of the Pleistocene epoch (2.5 million to 12,000 years ago), alternating introductions and extinctions of plant species with various geographic affinities occurred. The existence of both the peat moss and alpine laurel, hanging on since the Pleistocene, represent such shifts in plant composition. Some plant species groups migrated along well-defined paths into or near the Bodie Hills, and it is likely that the Sierra Nevada served as the principal high-elevation migration route.

Plant List

The plant list was not included in this version of the document, due to it's size and complexity of the table structure. A hardcopy may be obtained by contacting the Bishop Field Office, Martin Oliver – Botanist at (760) 872-5035.

Resources and Suggested Reading

Plants

THE BRISTLECONE BOOK: A NATURAL HISTORY OF THE WORLD'S OLDEST TREES

Ronald M. Lanner Mountain Press Publishing Company, 2007

CACTI, AGAVES, AND YUCCAS OF CALIFORNIA AND NEVADA

Stephen Ingram

Cachuma Press, 2008

MOJAVE DESERT WILDFLOWERS: A FIELD GUIDE TO WILDFLOWERS, TREES, AND SHRUBS OF THE MOJAVE DESERT, INCLUDING THE MOJAVE NATIONAL PRESERVE, DEATH VALLEY NATIONAL PARK, AND JOSHUA TREE NATIONAL PARK

Pam MacKay

Falcon Press Publishing, 2003

SAGEBRUSH COUNTRY: A WILDFLOWER SANCTUARY

Ronald J. Taylor

Mountain Press Publishing Company, 1992

SHRUBS OF THE GREAT BASIN: A NATURAL HISTORY

Hugh N. Mozingo

University of Nevada Press, 1987

TREES OF THE GREAT BASIN: A NATURAL HISTORY

Ronald M. Lanner

University of Nevada Press, 1984

WILDFLOWERS OF THE EASTERN SIERRA AND ADJOINING MOJAVE DESERT AND GREAT BASIN

Laird R. Blackwell

Lone Pine Publishing, 2002

Natural History: General

CALIFORNIA'S EASTERN SIERRA: A VISITOR'S GUIDE

Sue Irwin

Cachuma Press, 1992

DEEPEST VALLEY: GUIDE TO OWENS VALLEY, ITS ROADSIDES AND MOUNTAIN TRAILS

2nd edition

Edited by Jeff Putman and Genny Smith

Spellbinder Books, 1995

LAWS FIELD GUIDE TO THE SIERRA NEVADA

John Muir Laws
Heyday Books, 2007

MAMMOTH LAKES SIERRA: A HANDBOOK FOR ROADSIDE AND TRAIL

7th ed., revised
Edited by Genny Smith
Genny Smith Books, 2006

NATURAL HISTORY OF THE WHITE-INYO RANGE, EASTERN CALIFORNIA

Edited by Clarence A. Hall, Jr.
University of California Press, 1991

SIERRA EAST: EDGE OF THE GREAT BASIN

Edited by Genny Smith
University of California Press, 2003

Geology

GEOLOGY UNDERFOOT IN DEATH VALLEY AND OWENS VALLEY

Robert P. Sharp and Allen F. Glazner
Mountain Press Publishing Company, 1997

GUIDEBOOK TO THE GEOLOGY OF A PORTION OF THE EASTERN SIERRA NEVADA, OWENS VALLEY, AND WHITE-INYO RANGE

Clemens Arvid Nelson
UCLA Dept. of Earth and Space Sciences, 1980

ROADSIDE GEOLOGY OF THE EASTERN SIERRA REGION: BODIE, MONO LAKE, YOSEMITE, JUNE LAKE, DEVIL'S POSTPILE, CONVICT LAKE, WHITE MOUNTAINS

Geological Society of the Oregon Country, 1982

Native American

MYTHS OF THE OWENS VALLEY PAIUTE

Julian H. Steward
Kessinger Publishing, 2007

WEAVING A LEGACY: INDIAN BASKETS AND THE PEOPLE OF OWENS VALLEY, CALIFORNIA

Sharon E. Dean et. al.
The University of Utah Press, 2004

SURVIVAL ARTS OF THE PRIMITIVE PAIUTES

Margaret M. Wheat
University of Nevada Press, 1967

Find guides and references in Visitor Centers and bookstores throughout the Eastern Sierra.

Credits

The following agencies and organizations have contributed to the development, production, and/or distribution of this guide:

- Bristlecone Chapter
- Bureau of Land Management
- Eastern Sierra Interpretive Association
- U.S. Department of Transportation – Federal Highway Administration
- U.S. Forest Service

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Concept and text: Anne Halford, Kathleen Nelson, Sue Weis

Design and production: www.nilsdavisdesign.com

Proofreading: www.TheTypeRighter.com

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